

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claims 1-6 have been canceled.

7. (new) A method for operating a gas burner using an ionization sensor supplying an ionization signal that is representative of a condition of operation of the gas burner, the method comprising:

during a first time period, detecting an ionization signal during full-load operation of the gas burner and detecting another ionization signal during a partial-load operation of the gas burner, the detected ionization signals having a first difference in signal;

during a second time period that is different than the first time period, detecting an ionization signal during full-load operation of the gas burner and detecting another ionization signal during a partial-load operation of the gas burner, the detected ionization signals having a second difference in signal; and

determining a condition of operation of the gas burner as a function of a comparison of the first difference in signal with the second difference in signal.

8. (new) The method of claim 7, wherein determining a condition of operation of the gas burner as a function of a comparison of the first difference in signal with the second difference in signal includes determining an age characteristic of the ionization sensor.

9. (new) The method of claim 7, further comprising:

determining a threshold amount of deviation of the first and second differences from one another; and

wherein determining a condition of operation of the gas burner as a function of a comparison of the first difference in signal with the second difference in signal includes determining a condition of operation of the gas burner as a function of the deviation of the first and second differences exceeding the determined threshold amount of deviation.

10. (new) The method of claim 9, further comprising activating a maintenance indication as a function of the deviation of the first and second differences exceeding the determined threshold amount of deviation.

11. (new) The method of claim 9, further comprising controlling the gas burner as a function of the deviation of the first and second differences exceeding the determined threshold amount of deviation.

12. (new) The method of claim 11, further comprising deactivating the gas burner as a function of the deviation of the first and second differences exceeding the determined threshold amount of deviation.

13. (new) The method of claim 7, further comprising controlling the gas burner as a function of the determined condition of operation of the gas burner.

14. (new) The method of claim 7, wherein the full-load operation during the first and second time periods is about identical and wherein the partial-load operation during the first and second time periods is about identical.

15. (new) A method for operating a gas burner arrangement including a gas burner, the method comprising:

providing an ionization sensor configured and arranged to generate an ionization signal that is representative of a condition of operation of the gas burner;

during a plurality of time periods, detecting ionization signals from the ionization sensor during full-load and partial-load operation of the gas burner;

for each time period, determining a difference between the ionization signals at full-load and partial-load operation; and

determining a condition of operation of the gas burner as a function of a deviation, for successive time periods, in determined differences in ionization signals at full-load and partial-load operation.

16. (new) The method of claim 15, further comprising determining a condition of operation of the gas burner as a function of a deviation in differences in ionization signals of full-load and partial-load operation for a plurality of the time periods.

17. (new) The method of claim 15, further comprising controlling the operation of the gas burner as a function of the determined condition of operation of the gas burner.

18. (new) The method of claim 15, further comprising:
determining a threshold amount of deviation in determined differences in ionization signals; and
wherein determining a condition of operation of the gas burner as a function of a deviation includes determining a condition of operation of the gas burner as a function of the deviation in determined differences in ionization signals at full-load and partial-load operation for a successive time period exceeding the determined threshold amount of deviation.

19. (new) The method of claim 18, further comprising controlling the operation of the gas burner in response to the deviation in determined differences in ionization signals at full-load and partial-load operation for a successive time period exceeding the determined threshold amount of deviation.

20. (new) The method of claim 19, wherein controlling the operation of the gas burner in response to the deviation in determined differences in ionization signals at full-load and partial-load operation for a successive time period exceeding the determined threshold amount of deviation includes disabling the gas burner.

21. (new) The method of claim 15, wherein determining a condition of operation of the gas burner as a function of a deviation includes determining a condition of operation of the ionization sensor.

22. (new) The method of claim 15, wherein providing an ionization sensor configured and arranged to generate an ionization signal that is representative of a condition of operation of the gas burner includes providing the gas burner arrangement, the gas burner arrangement including the gas burner and the ionization sensor.

23. (new) A method for detecting a condition of operation of an ionization sensor adapted to supply an ionization signal that is representative of a condition of operation of a gas burner, the method comprising:

 during first and second time periods, detecting ionization signals from the ionization sensor during full-load and partial-load operation of the gas burner;

 for each time period, determining a difference between the ionization signals at full-load and partial-load operation; and

 determining a condition of operation of the ionization sensor as a function of a deviation in the determined differences in ionization signals at full-load and partial-load operation between each time period.

24. (new) The method of claim 23, further comprising:

 controlling operation of the gas burner as a function of the determined condition of operation of the ionization sensor.

25. (new) The method of claim 23, wherein determining a condition of operation of the ionization sensor as a function of a deviation in the determined differences in ionization signals at full-load and partial-load operation between each time period includes determining a condition of operation of the gas burner.